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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/698,988

Filing Date: October 31, 2003

Appellant(s): SAGER ET AL.

Hao Y. Tung
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed October 28, 2011 appealing from the Office action mailed October 26, 2010.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

12 – 17, 19 – 22, 25 – 26, 28 – 38.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN

REJECTIONS.” New grounds of rejection (if any) are provided under the subheading “NEW GROUNDS OF REJECTION.”

WITHDRAWN REJECTIONS

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner: The 35 U.S.C. 112, first paragraph rejection of Claims 12 - 17, 19 - 22, 25 - 26, 28 -35 and 37 - 38.

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant’s brief.

(8) Evidence Relied Upon

Affidavit by David Chandler, dated June 11, 2009.

| | | |
|--------------|-----------------|---------|
| 6,264,741 B1 | BRINKER et al. | 07-2011 |
| 6,866,901 B2 | BURROWS et al. | 3-2005 |
| 6,727,513 B2 | FUJIMORI et al. | 4-2004 |
| 1225188 A1 | DAMS | 7-2002 |

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 12 - 17, 19 – 22, 25 – 26 and 28 - 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brinker et al (U.S. Patent No. 6,264,741 B1) in view of Dams (European Patent No. 1225188) and Burrows et al (U.S. Patent No. 6,866,901 B2) and Fujimori et al (U.S. Patent No. 6,727,513 B2).

With regard to Claims 12 - 13, 16 - 17, 19, 25, 28 - 30, 34 - 36 and 38, Brinker et al discloses an inorganic / organic (column 3, lines 9 - 10) nanolaminates (column 3, line 30) film (column 3, line 66) which has a plurality of layers of an inorganic material (silicate layers, therefore discrete layers comprising multiple layers or lamellae and consisting of silicate and having a different composition from a polymer layer; column 4, line 30) and a plurality of layers each consisting of an organic polymer (column 4, lines 63 - 64), therefore hydrophobic, wherein, the layers of organic polymer alternate with the layers of inorganic material (column 3, lines 15 - 20) wherein the adjacent layers of the film are covalently bonded layers characterized by direct organic polymer - inorganic material covalent bonds (column 5, lines 33 - 35); the inorganic material therefore presents a long and tortuous path to an underlying substrate (tortuous path; column 5, lines 13 - 15); the organic material is hydrophobic (column 3, lines 15 - 20) and the film is a coating (column 3, line 51) the film is therefore a barrier film; the film comprises a hydrophobic compound (column 4, lines 20 - 25), and therefore has a tuned hydrophobicity that decreases the permeability of the film relative to a film that is hydrophilic; the film has between 100 and 1000 layers (column 3, line 44 - 46); Brinker et al also disclose self- assembly of nanostructures (column 3, lines 3 - 8); Brinker et al also disclose micelle formation and incorporation of polymer precursors into the micellar interiors (column 5, lines 15 - 24). Brinker

et al fail to disclose layers that contain superhydrophobic material and comprise fluoroalkylsilane and a solar cell encapsulated with the film.

Dams teaches a monomer comprising fluoroalkylsilane (paragraph 0008), therefore superhydrophobic, for a coating (paragraph 0052) for the purpose of obtaining a coating that is oil repellent (paragraph 0011). One of ordinary skill in the art would therefore recognize the advantage of providing for the monomer of Dams et al in Brinker et al, which comprises a coating, depending on the desired use of the end product.

Burrows et al teach a solar cell (column 5, lines 29 - 30) encapsulated with a barrier film (barrier stack; column 5, lines 44 - 49) for the purpose of obtaining protection from moisture, gas and contaminants (column 5, lines 22 - 25). One of ordinary skill in the art would therefore recognize the advantage of providing for the encapsulation of Burrows et al in Brinker et al, which comprises a solar cell, depending on the desired protection of the end product.

It therefore would have been obvious for one of ordinary skill in the art to have provided for one or more superhydrophobic layers comprising fluoroalkylsilane in Brinker et al in order to obtain a layer that is oil repellent as taught by Dams and to have provided for encapsulation of a solar cell in Brinker et al in order to obtain protection from moisture, gas and contaminants as taught by Burrows et al. Because Brinker et al disclose a superhydrophobic material, Brinker et al disclose a material that is impedes the movement of water between adjacent layers of the organic polymer and the inorganic material.

Brinker et al, Dams and Burrows et al do not establish that it is physically possible to form a self- assembled film using a superhydrophobic monomer, but Fujimori et al teach a self-

assembled film (column 3, line 26) comprising fluoroalkylsilane (column 3, lines 45 - 49).

Fujimori et al therefore establishes that it is known in the art that it is physically possible.

With regard to Claim 14, Brinker et al disclose a nanolaminate, as stated above, and therefore disclose layers of organic material having a thickness of 1 nm.

With regard to Claim 15, the film disclosed by Brinker et al is transparent (column 3, line 50).

With regard to Claims 20 - 21, the layers disclosed by Brinker et al are hydrophobic, as stated above, and therefore comprise layers made from polymer precursors to which a hydrophobic group comprising methyl has been added.

With regard to Claims 22, 26 and 31 - 33, Brinker et al disclose a Gemini surfactant (column 4, lines 45 - 46) and tubules (column 8, line 6) and layers which are self assembled (column 5, lines 7 - 31).

With regard to Claim 37, a solar cell, therefore a photovoltaic device, having an inorganic layer in contact with the photovoltaic device, would therefore be disclosed by Brinker et al.

(10) Response to Argument

Appellant argues that there is no rationale to provide for the fluoroalkylsilane monomer of Dams in Brinker et al, because the use of a monomer that is superhydrophobic will likely interfere with the self - assembly of Brinker et al.

However, Brinker et al do not exclude fluoroalkylsilane from use as the disclosed hydrophobic monomer, or state that fluoroalkylsilane monomers interfere with self assembly.

Appellant also argues that the Chandler affidavit of June 11, 2009 states that superhydrophobic material would likely interfere with the self – assembly of Brinker et al, because a balance of hydrophilic and hydrophobic forces is required for self – assembly.

However, as stated above, Brinker et al do not exclude fluoroalkylsilane, or indicate that fluoroalkylsilane would interfere with self - assembly. The fact that self - assembly occurs in the claimed invention also indicates that fluoroalkylsilane does not interfere with self - assembly. Furthermore, as stated on page 5 of the previous Action, Fujimori discloses a layer of fluoroalkylsilane that is self - assembled.

Appellant also argues that although Fujimori discloses a self – assembled layer comprising fluoroalkylsilane, Fujimori discloses a self - assembled layer that is a single layer, and therefore Fujimori does not provide any teaching or suggestion as to the self – assembly of a multi – layer laminate comprising fluoroalkylsilane.

However, the disclosure in Fujimori of fluoroalkylsilane that is self – assembled contradicts the statement in the Chandler affidavit that fluoroalkylsilane units attract one another too strongly for self - assembly to occur; it is also noted that the face on which the self – assembled film of Fujimori is formed is hydrophilic (column 3, lines 45 - 49 of Fujimori).

Appellant also argues that the Chandler affidavit shows that the claimed laminate is surprising.

However, as stated above, the disclosure in Fujimori of fluoroalkylsilane that is self – assembled contradicts the statement in the Chandler affidavit that fluoroalkylsilane units attract one another too strongly for self - assembly to occur; furthermore, as stated above, the fact that

self - assembly occurs in the claimed invention indicates that fluoroalkylsilane does not interfere with self – assembly, and that the occurrence of self - assembly is therefore not surprising.

Appellant also argues that the claimed aspect of direct covalent bonding between adjacent layers is not disclosed by the single layer of Fujimori.

However, as stated in the previous Action, direct covalent bonding is disclosed by Brinker et al; furthermore, the use of fluoroalkylsilane as a hydrophobic monomer is not excluded by Brinker et al.

Appellant also argues that the majority of the citations do not disclose self – assembly, and Appellant states as an example that the deposition of the layers of Burrows et al appears in separate steps.

However, self – assembly is disclosed by Brinker et al; furthermore, Burrows et al is cited only for the teaching that it is well - known in the art to encapsulate a solar cell with a barrier film, and that it would therefore have been obvious for one of ordinary skill in the art to have provided for the encapsulation of a solar cell with the film of Brinker et al.

Appellant also argues that Dams merely suggests surface application, and that combining Brinker et al with Dams therefore does not incorporate fluoroalkylsilane into Brinker et al as claimed.

However, because the hydrophobic monomer disclosed by Brinker et al is incorporated into Brinker et al as claimed, the use of fluoroalkylsilane as the hydrophobic monomer would incorporate fluoroalkylsilane into Brinker et al as claimed.

Appellant also argues that because Dams and Burrows et al do not disclose self - assembly, the combination of Dams and Burrows et al alters the fundamentals of Brinker et al.

However, there is no disclosure by Brinker et al that the encapsulation of a solar cell, as taught by Burrows et al, and the use of fluoroalkylsilane, as taught by Dams, would alter the self - assembly taught by Brinker et al.

Appellant also argues that Brinker et al seek to mimic nacre, which is a poor moisture barrier.

However, although Brinker et al seek to mimic nacre in terms of forming a layered structure that minimizes pores and defects, Brinker et al do not disclose a structure that is chemically identical to nacre, or that has its moisture barrier properties. Furthermore, Brinker et al comprises hydrophobic monomers, as claimed, and is therefore comprises layers that are a barrier to moisture.

Appellant also argues that Brinker et al, in column 1, lines 36 – 44, discard self – assembled films that are monolayer films, like the film disclosed by Fujimori, as being incompatible to forming the composite described in Brinker et al.

However, crystallization beneath Langmuir monolayers, discussed by Brinker et al in column 1, lines 36 - 44, is not disclosed by Fujimori.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Marc A Patterson/

Primary Examiner, Art Unit 1782

Conferees:

/Diana Dudash/
Primary Examiner

/Rena L. Dye/
Supervisory Patent Examiner, Art Unit 1782